

What is claimed is:

1. A generator control circuit of an ac generator for charging a battery which includes a field coil, said generator control circuit comprising:

a voltage regulator for regulating an output voltage of said ac generator to a regulation voltage,

a comparator for providing a first signal when the output voltage of the ac generator is equal to or lower than the regulation voltage and higher than a predetermined voltage which is higher than voltage of said battery when said battery is open; and

means for alarming when said comparator does not provide the first signal.

2. The generator control circuit as claimed in claim 1,

wherein said voltage regulator comprises a first switch having an output terminal connected to the field coil,

wherein the predetermine voltage of said comparator is equal to the regulation voltage so that said comparator provides a regulation voltage signal to turn on or off said first switch to control current supplied to the field coil when the output voltage becomes higher than the regulation voltage, and

wherein the first signal is formed from the regulation voltage.

and

3. The generator control circuit as claimed in claim 1,

wherein said alarming means comprises a holding circuit for holding said alarming means inoperative after the generator is operated and said comparator provides the first signal and a second switch controlled by said holding circuit.

4. The generator control circuit as claimed in claim 2,

wherein said alarming means comprises a holding circuit for holding said alarming means inoperative after the generator is operated and said comparator provides the first signal and a second switch controlled by said holding circuit.

5. The generator control circuit as claimed in claim 5, further comprising a discrimination circuit connected to the field coil,

wherein said discrimination circuit provides a signal for resetting said holding circuit to hold said alarming means operative if field current is not controlled by said first switch irrespective of the first signal.

6. The generator control circuit as claimed in claim 5, further comprising an OFF circuit for temporarily turning off the first switch if the output voltage of the generator becomes lower than the predetermined voltage.

7. The generator control circuit as claimed in claim 6,

wherein said OFF circuit comprises means for cyclically turning off said first switch.

8. The generator control circuit as claimed in claim 6,

wherein said OFF circuit turns off the first switch when the output voltage of the generator becomes higher than a first predetermined voltage that is lower than the regulation voltage and higher than a battery open voltage before said comparator provides the first signal, and turns on the first switch after said comparator provides the first signal if the output voltage of the generator becomes lower than a second voltage that is lower than the first voltage and higher than a battery voltage which is finally discharged.

9. The generator control circuit as claimed in claim 8,

wherein said OFF circuit comprises means for maintaining said first switch to turn off for a first off period until the output voltage of the generator becomes higher than the first predetermined voltage and for a second off period that is shorter than the first off period if the output voltage of the generator becomes lower than the second reference voltage.

10. A generator control circuit of an ac generator for charging a battery which includes a field coil, said generator control circuit comprising:

output control means for providing a first control signal to reduce current supplied to the field coil when the output value of the generator is higher than a regulation value and a second control signal to increase the current supplied to the field coil when the output value of the generator is lower than the regulation value;

control switching means for maintaining a first control operation until said output control means provides the first control signal and changing from the first control operation to a second control operation

when said output control means provides the second control signal.

11. The generator control circuit as claimed in claim 10,  
wherein said output control means comprises a first comparator which compares the output value of the generator with the regulation value, and said control switching means comprises a first switch which controls field current supplied to the field coil according to an output signal of said first comparator.

12. The generator control circuit as claimed in claim 10, further comprising a second comparator for comparing the field current with a reference value and an OFF circuit which provides an output signal to control said first switch for a predetermined period.

13. The generator control circuit as claimed in claim 10,  
wherein said control switching means comprises holding means for holding said second control operation after said output control means provides the first control signal.

14. The generator control circuit as claimed in claim 13,  
wherein said control switching means comprises a second switch which operates according to a condition of said holding means.